

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
18 November 2004 (18.11.2004)

PCT

(10) International Publication Number
WO 2004/100525 A2

(51) International Patent Classification⁷: **H04N**
(21) International Application Number:
PCT/US2004/013876

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(22) International Filing Date: 5 May 2004 (05.05.2004)

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(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/467,951 5 May 2003 (05.05.2003) US

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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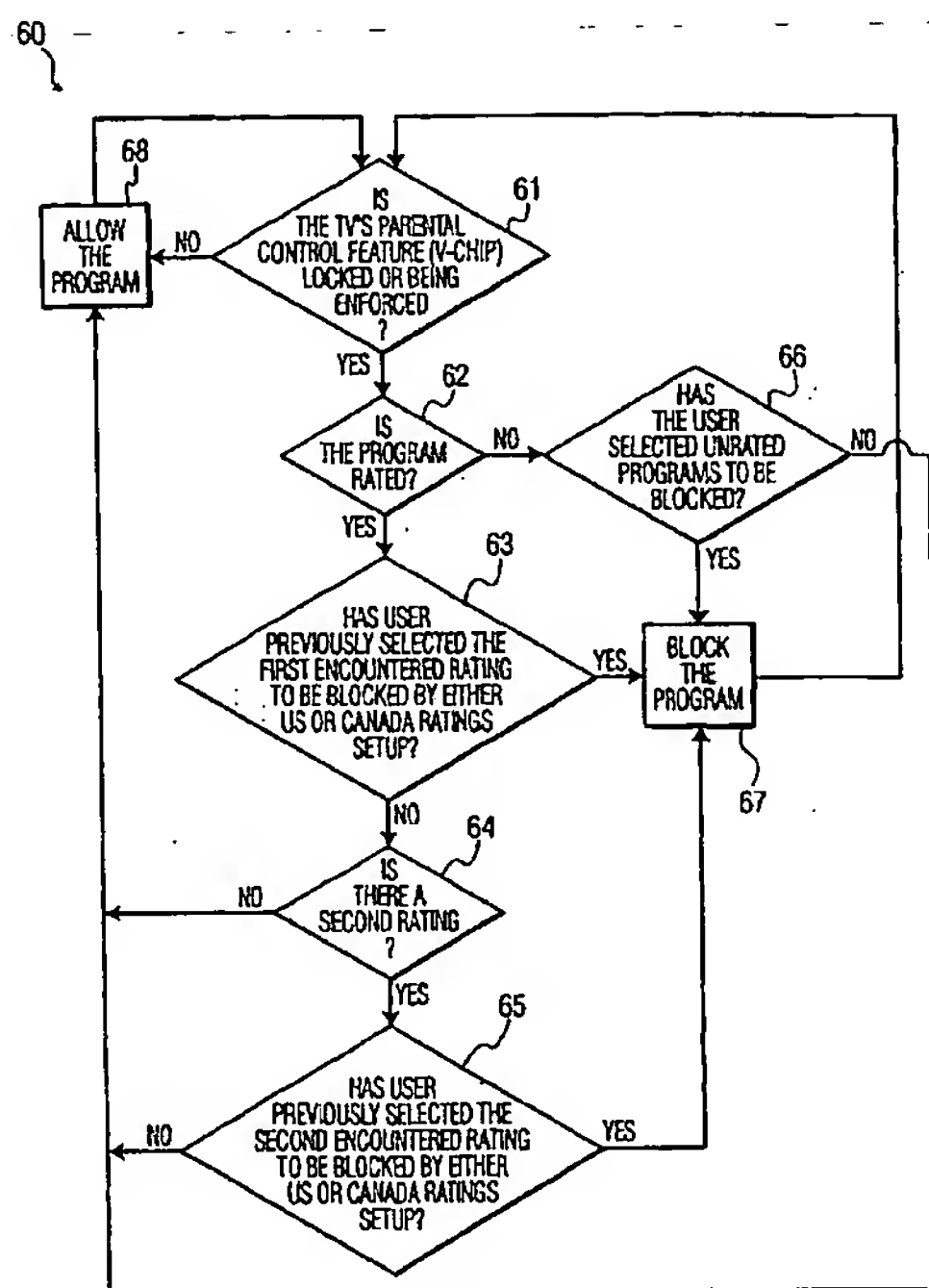
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(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR PROCESSING A DIGITAL TELEVISION SIGNAL HAVING MULTIPLE CONTENT RATINGS EACH ONE ASSOCIATED WITH A DIFFERENT CONTENT RATING SYSTEM



(57) Abstract: A television signal receiver provides processing of a digital television signal having content rating data for multiple content rating systems. The television signal receiver processes the received digital television signal to obtain a program signal and each one of the received multiple content ratings data. The television signal receiver prevents using of the program signal if either one of the obtained first and second content ratings data correspond to a blocked content rating setting of the respective first and second content ratings systems.

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GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— *without international search report and to be republished upon receipt of that report*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

10/ 556236

REC-PTO 09 NOV 2005

WO 2004/100525

PCT/US2004/013876

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**SYSTEM AND METHOD FOR PROCESSING A DIGITAL TELEVISION SIGNAL
HAVING MULTIPLE CONTENT RATINGS EACH ONE ASSOCIATED WITH A
DIFFERENT CONTENT RATING SYSTEM**

5 Background

This U.S. non-provisional patent application claims the benefit of and/or priority to U.S. provisional patent application serial number 60/467,951 filed May 5, 2003 entitled "Method to handle television programs encoded with two different rating systems", the contents of which is specifically incorporated herein by
10 reference.

Field of the Invention

The present invention relates to digital television signal processing and, more particularly, to the processing of auxiliary data in the form of multiple program
15 content rating data contained in a digital television signal.

Background Information

In the United States and Canada, television signals now carry content rating information or data regarding particular television programs. As such, television
20 systems are required to be able to receive, decode and utilize (i.e. process) the content rating information or data. Program rating information or data may then be used to allow/provide parental control or program blocking of particular television programs and/or channels. Implementation of the rating information/data processing and/or parental control/program blocking in television systems is
25 commonly known as the V-chip.

With respect to analog television systems (i.e. television systems that receive and process analog television signals) such as NTSC systems in the United States and Canada, only a single content rating is provided in the analog television signal. Particularly, the single content rating is provided in line 21 of the extended
30 data service (XDS) portion of the analog television signal. In digital television systems (i.e. television systems that receive and process digital television signals) such as ATSC systems in the United States and Canada, multiple content ratings

for multiple rating systems may be received simultaneously. In digital television signals, this content rating data is provided in the PSIP (Program and System Information Protocol) portion of the digital bit stream. The digital television system may thus receive multiple V-chip ratings for multiple V-chip systems or protocols simultaneously for a single television program, especially where the broadcaster is
5 complying with the laws of each country in which the digital television signal is provided or may be received.

A problem thus arises in television systems that receive digital television signals having multiple content rating data for multiple content rating systems in
10 that such television systems do not know how to react in response to the multiple rating systems information (e.g. in response to both a US and Canadian V-chip rating that can be received simultaneously for a single television program in the PSIP data for an ATSC channel). Particularly, such television systems are simply confused when two rating systems (i.e. two content rating systems data) are
15 received.

It is thus evident from the above discussion that what is needed is a television system for digital television signals that can process and/or utilize a television signal having multiple content rating systems data.

This need and others are accomplished through application of the principles
20 of the subject invention and/or as embodied in one or more various forms and/or structures such as are shown and/or described herein.

Summary

A television signal receiver provides processing of a digital television signal
25 having multiple content rating data for multiple content rating systems. The television signal receiver processes the received digital television signal to obtain a program signal and each one of the received multiple content ratings data. The television signal receiver prevents using of the program signal if either one of the obtained first and second content ratings data correspond to a blocked content
30 rating setting for the respective first and second content ratings systems.

In one form, there is provided a method of processing a digital television signal. The method includes the steps of: (a) receiving a digital television signal having first content rating data associated with a first content rating system and second content rating data associated with a second content rating system; (b) processing the received digital television signal to obtain a television program signal; (c) processing the received digital television signal to obtain the first and second content ratings data; and (d) preventing using of the program signal if either one of the obtained first and second content ratings data correspond to a blocked content rating setting for the respective first and second content ratings systems.

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Brief Description of the Drawings

In the drawings:

FIG. 1 is a block diagram view of an exemplary digital television signal system/apparatus in which the subject invention may be embodied; and

15 FIG. 2 is a flowchart of an exemplary manner of operation of the subject invention in accordance with the present principles.

Corresponding reference characters tend to indicate corresponding parts throughout the several views.

20 Description of the Preferred Embodiment(s)

Referring now to FIG. 1, there is depicted an exemplary representation of a television signal receiver generally designated 20 in which the subject invention may be embodied. The television signal receiver 20 is representative of various types of receivers and/or devices that receive and/or process digital television signals. It should be understood that while the television signal receiver 20 is described herein with respect to the processing of digital television signals and auxiliary data within the digital television signal such as via Program and System Information Protocol (PSIP) or PAT/PMT data or the like in the form of content rating data accompanying, contained and/or embedded in the received digital

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television signal, the television signal receiver 20 may also receive and process analog television signals both with and without accompanying auxiliary data or with only a certain type of auxiliary data. Moreover, the television signal receiver 20 is operable to receive and process digital television signals without accompanying PSIP data in the form of content rating data. It should be appreciated that the television signal receiver 20 also includes various television apparatus components that are not shown and/or described herein, but which are typical and/or necessary for a properly functioning television signal receiver.

The television signal receiver 20 has a digital television signal input 24 that is configured to receive digital television signals from a digital television signal source 26. The digital television signal input 24 may be any type of digital television signal input that is operable, configured and/or adapted to receive a digital television signal from a digital television signal source 26. The input 24 is connected to a digital television signal tuner 28. The digital television signal tuner 28 is operable, adapted and/or configured to receive the digital television signal from the digital television source 26 and tune to a particular digital television signal, channel or frequency. Tuning of the digital tuner 28 is accomplished in a manner such as is known in the art. While it is typical that the digital television signal provided by the digital television source 26 contains multiple digital television channels, the term digital television signal, as used herein, encompasses one or more digital television channels.

The television signal receiver 20 also includes a digital television signal processor 30 that is operable, adapted and/or configured to process and/or provide processing of a digital television signal. As such, the digital signal processor 30 includes digital television signal circuitry/logic embodied as one or more integrated circuits and/or circuit elements. Moreover, the digital television signal processor 30 may utilize program instructions (e.g. software) 42 for some or all aspects of the signal processing. It should be also be appreciated that the various components, features and/or functions of the television signal receiver and/or the television signal receiver itself utilize program instructions 42.

The digital television signal processor 30 is connected to an output of the digital television tuner 28 in order to receive the digital television signal selected (tuned) by the digital television signal tuner 28. The digital television signal

processor 30 may provide a signal or signals to the digital television signal tuner 28 (as represented by the dashed arrow emanating from the digital television signal processor and directed toward the tuner) in order for the digital television signal tuner 28 to tune to a particular digital television channel. Input regarding the tuning of the television signal receiver is typically, but not necessarily, provided by a user of the television signal receiver from a remote control (not shown), front panel of the television signal receiver, or the like.

The digital television signal processor 30 is, among other features and/or functions, operable to obtain and/or assemble a program signal from the tuned digital television signal. The program signal is suitable for display on a display 22 and/or for playing through a speaker or speakers (not shown). Particularly, the program signal may be a video signal, an audio signal or both an audio/video signal. The audio signal or portion of the program signal (if at all) is provided to integral or external speakers (not shown) and/or to another component for further processing. The video signal or portion of the program signal is provided to a buffer 40 and is in a format that is appropriate for showing on the display 22. It should be appreciated that the display 22 may or may not be integral with the television signal receiver 20 as represented by the dashed lines about the display 22. The resulting video signal portion of the program signal (or program signal itself) is provided to a buffer 40. The buffer 40 is operable to temporarily store the video signal as appropriate. Output of the buffer 40 comprising the video signal and any on-screen generated data (provided by an on-screen display generator 38) are provided to the display 22.

Moreover, the digital television signal processor 30 is operable to parse, extract and/or separate auxiliary data, if any, from the digital television signal for processing thereof. While there may be various types of auxiliary data, the present invention is concerned with auxiliary data in the form of content rating data and thus the term auxiliary data is applied to content rating data. The auxiliary data may be in a PSIP portion of the digital television signal, in a PAT/PMT portion of the digital television, or other non-standard portion of the digital television signal. Hereinafter, it will be assumed that the auxiliary data is contained in the PSIP or PSIP portion of the digital television signal. It should be appreciated that the use of PSIP portion is considered to include and/or mean all types of presentation of content rating data

(auxiliary data) contained in the digital television signal, such as via the PAT/PMT portion or otherwise of the digital television signal.

The digital television signal processor 30 is thus operable to obtain PSIP data from the digital television signal in the form of content rating data. More particularly, the digital television signal processor 30 is operable to obtain multiple content rating data from the PSIP portion of the digital television signal, each content rating data corresponding to a different content rating system. Preferably, though, the digital television signal processor 30 is operable to obtain two different content ratings data from the PSIP portion of the digital television signal each one of which is coded with respect to a different content rating system.

The content rating data and/or content rating systems are typically known as V-chip systems. Such V-chip systems provide parental control of television programs, channels or the like in order to either allow or block (prevent) viewing (and/or hearing) thereof. While there may be many implementations of such V-chip systems, the United States has implemented a television program content rating, V-chip, parental control or blocking/viewing system or protocol (i.e. the U.S. content rating system) and Canada has implemented a different television program content rating, V-chip, parental control or blocking/viewing system or protocol (i.e. the Canadian content rating system). The Canadian content rating system has different levels, different number of ratings, different rating categories, different names for the ratings, and the like than the U.S. content rating system. It should be appreciated that the use of the U.S. and Canadian content rating systems is only exemplary of the manner in which the present television signal receiver can process two (or multiple) different content rating data with respect to two (or multiple) different content rating systems.

As such, the digital television signal processor 30 is operable to obtain both the U.S. content rating data and the Canadian content rating data from the PSIP portion of the digital television signal. The digital television signal processor 30 may also obtain other content rating data for other content rating systems that are embedded or encoded into the PSIP portion of the digital television signal. Additionally, the digital television signal processor 30 is operative to extract, obtain and/or separate other PSIP data as appropriate. The digital television signal processor 30 may, and preferably does, utilize program instructions 42 for some or

all aspects of the PSIP data processing. Of course, in a general sense, the digital television signal processor is configured, adapted and/or operable to obtain two or more program rating data from the digital television signal.

The obtained content ratings data, and other PSIP data, is provided to a PSIP data processor 32. The PSIP data processor 32 is operable, configured and/or adapted to process the received content ratings data. It should be appreciated that while the present principles apply to the receipt and processing of multiple content ratings data/systems, the principles of the subject disclosure will be described with reference to two different program content rating systems/data. As such, the PSIP data processor 32 includes a first program content rating system processor 34 and a second program content rating system processor 36.

Arbitrarily, the first content rating system processor 34 is operable, configured and/or adapted to process the U.S. television signal/program content rating system data, while the second content rating system processor 36 is operable, configured and/or adapted to process the Canadian television signal program content rating system data. Of course, each one of the first and second content rating system processors may process other content rating data.

The television signal receiver 20 also includes memory 46 that is operable, configured and/or adapted to store television signal receiver data such as user settings and/or the like. One type of user setting that the memory 46 retains is program content rating settings or data. The memory 46 stores data relating or corresponding to rating settings that a user has provided for either the blocking and/or viewing of television programs or signals in accordance with a particular content rating system. Particularly, the memory stores first content rating system settings or data 48 (here, in keeping with the stated nomenclature, arbitrarily relating or corresponding to the U.S. content rating system) and second content rating system settings or data 50 (again, here, in keeping with the stated nomenclature, arbitrarily relating or corresponding to the Canadian content rating system). A user, such as a parent, is able to indicate which programs are viewable and/or blocked (prevented from being viewed and/or heard) with regard to various content ratings for both content rating systems. This is usually accomplished via an on-screen menu such as is known in the art.

To this end, the television signal receiver 20 includes an on-screen display generator 38 that is operable to provide an on-screen user interface (UI) in the form of a menu having various user selectable options, choices or selections. The user menu provides access to features and/or functions of the television that are changeable or settable by the user some of which are typical and known in the art. However, in accordance with an aspect of the subject invention, one such feature is the selection of whether or not programs of various content ratings should be viewed or blocked.

In particular, the on-screen display generator 38 in conjunction with program instructions 42 and/or the digital television signal processor 30 (as represented by the dashed arrow emanating from the digital television signal processor 30 and pointing at the on-screen display generator 38) allows the user to select whether program blocking is enabled or not for each one of the multiple program content rating systems. The rating systems menu also allows the user to select content rating settings and/or set the content rating levels of blocking (if any) for each content rating system. These selections are stored in the first content rating systems setting portion 48 of the memory 46, and the second content rating systems setting portion 50 of the memory 46.

The first content rating system processor 34 is further operable, configured and/or adapted to utilize the content rating settings or data retained in the first content rating system settings area 48 with respect to the content rating data from the first content rating system processor 34. Particularly, the content rating data from the first content rating system processor 34 and the content rating setting data from the first content rating system settings memory portion 48 are compared to determine whether the program signal should be blocked or viewed. Of course, if the television signal receiver 20 is set to disregard content rating data with respect to the first content rating data of the received digital television signal, or to disregard all content rating data, no comparison would be performed. Disregard of content ratings may be described as the program content rating system as being unlocked, unenforced or the like.

The second content rating system processor 36 is further operable, configured and/or adapted to utilize the content rating settings or data retained in the second content rating system settings area 50 with respect to the content rating

data from the second content rating system processor 36. Particularly, the content rating data from the second content rating system processor 36 and the content rating setting data from the second content rating system settings memory portion 50 are compared to determine whether the program signal should be blocked or viewed. Of course, if the television signal receiver 20 is set to disregard content rating data with respect to the second content rating data of the received digital television signal, or to disregard all content rating data, no comparison would be performed. Again, disregard of content ratings as a whole may be described as the program content rating system as being unlocked, unenforced or the like.

10 The television signal receiver 20 may be programmed with the program instructions 42 to utilize the first and second rating data from the digital television signal in a variety of manners. All of these manners may be selectable by the user through menu options. If program content rating data is not part of the digital television signal, the television signal receiver 20 may allow the user the option to
15 allow or block such programming. One such manner of processing first and second content rating data by the television signal receiver 20 is to only utilize one of the two received content rating data. The other content rating data of the two would be ignored. With this method, an option would be to have the television signal receiver 20 be "hardwired" rather than through user selection of such an option. Another
20 manner of processing first and second content rating data would be to compare first received content rating data (e.g. content rating "A" or "first") of the first and second content rating data against one of the first and second stored content rating settings and block or allow accordingly, then, if allowed, to compare second received content rating data (e.g. content rating "B" or "second") of the first and second
25 content rating data against the other of the first and second content rating data and block or allow accordingly. This manner may be expanded to include multiple content rating data and multiple content rating systems.

The digital television signal receiver 20 receives the multiple (e.g. first or A content rating data, and second or B content rating data in the case of two different
30 content rating data for two different content rating systems) content rating data for multiple content rating systems via the received digital television signal. The multiple content rating data is received essentially simultaneously by the television signal receiver 20 as well as the processors/processing portions of the television

signal receiver 20. Thus, the present invention provides a manner in which multiple content rating data that is received simultaneously or sequentially may be processed.

Referring now to FIG. 2, there is depicted a flowchart, generally designated 60, of an exemplary manner of operation of the television signal receiver 20 with respect to the receipt of multiple program content rating data/system processing in accordance with the present principles. The exemplary manner of processing a digital television signal having two or more (i.e. multiple) content ratings data for corresponding two or more (i.e. multiple) program content rating systems is provided as steps or blocks. The program content blocking/viewing feature of the television signal receiver 20 is designated collectively as a parental control feature. It should be appreciated that the parental control feature is a generic term for the V-chip feature or the ability to allow the blocking and/or viewing of a television program. Moreover, the term "viewing" encompasses viewing of the program signal as program signal is defined herein.

In block 61, the television signal receiver 20 determines whether the parental control feature is being enforced (is on or off, or is in a total allowed mode). If the parental control feature is not being enforced (i.e. NO), then program flow proceeds to block 68. In block 68, the television signal receiver 20 allows the viewing of the program regardless of whether the digital television signal includes two or more (or any) content ratings each one of the two or more being associated with a different content rating system. The television then continues to monitor the status of the parental control feature (i.e. whether parental control is being enforced). If in block 61 the parental control feature is being enforced (i.e. YES), then program flow proceeds to block 62.

In block 62 the television signal receiver 20 determines if the program is rated. The television signal receiver 20 determines if the PSIP data of the received digital television signal indicates that the program is unrated or if there is no program content rating. If there is no content rating or no content rating data (i.e. NO), program flow goes to block 66. In block 66 it is determined whether unrated programs were selected by the user to be blocked or viewable. If such programs are viewable (i.e. NO), then program flow goes to block 68 and program use is

allowed. If such programs are blocked (i.e. YES), then program flow goes to block 67 and the program (program signal) is blocked.

If, however, in block 62 the program is rated (i.e. has program content rating data), then program flow goes to block 63. In block 63 it is determined whether the user has previously selected the first encountered rating to be blocked by either the US or Canada ratings setup by the user. If YES, then program flow goes to block 67 and the program is blocked. If NO, then program flow goes to block 64.

In block 64 it is determined whether there is a second program content rating. If not, (i.e. NO), then the program is allowed (block 68). If there is a second program content rating (i.e. YES), then program flow goes to block 65. In block 65 it is then determined whether the user has previously selected to use the second encountered content rating data to be blocked by either the US or Canada rating system. If YES, then the program is blocked (block 67). If the user has not, then the program is allowed (block 68).

It should be appreciated that the flowchart 60 described above and depicted in FIG. 2 provides a complete manner of exemplary operation of the digital television signal receiver 20 as described herein. Every step, however, is not necessary for implementation of the subject invention. The subject invention may be implemented utilizing less steps than all of the steps of the flowchart 60. This may be reflected in the claims. Moreover, more or less steps in alternative embodiments of the procedure 60 may implement the subject invention in accordance with the principles recited herein. As well, subsets of the above procedure 60 may implement the principles of the subject invention rather than the whole procedure. Variations are also contemplated.

While this invention has been described as having a preferred design, the present invention can be further modified within the spirit and scope of this disclosure. This application is therefore intended to cover any variations, uses, of adaptations of the invention using its general principles. Further, this application is intended to cover such departures from the present disclosure as come within known or customary practice in the art to which this invention pertains and that fall within the limits of the appended claims.

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CLAIMS

1. A method of processing a digital television signal comprising the steps of:
 - (a) receiving a digital television signal having first content rating data
5 associated with a first content rating system and second content rating data
associated with a second content rating system;
 - (b) processing the received digital television signal to obtain a television
program signal;
 - (c) processing the received digital television signal to obtain the first and
10 second content ratings data; and
 - (d) preventing using of the program signal if either one of the obtained first
and second content ratings data correspond to a blocked content rating setting of
the respective first and second content ratings systems.
- 15 2. The method of claim 1, wherein the step of processing the received digital
television signal to obtain the first and second content ratings data includes
extracting the first and second content ratings data from an auxiliary data portion of
the digital television signal.
- 20 3. The method of claim 2, wherein the step of extracting the first and second
content ratings data from an auxiliary data portion of the digital television signal
includes utilizing a first content rating system processor for the first content rating
data, and a second content rating system processor for the second content rating
data.

4. The method of claim 3, wherein the first content rating system comprises a United States V-chip content rating system and the second content rating system comprises a Canadian V-chip content rating system.
- 5 5. The method of claim 1, wherein the step of processing the received digital television signal to obtain a television program signal comprises processing the received digital television signal to obtain a television program signal comprising one or more of a video signal and an audio signal.
- 10 6. A television signal receiver comprising:
a digital tuner operable to receive a digital television signal containing first and second content ratings data;
a digital television signal processor connected to said digital tuner and operable to i) obtain a program signal from the tuned digital television signal, and ii)
15 separate the first and second content ratings data from the tuned digital television signal; and
a content ratings data processor connected to said digital television signal processor and operable to i) process the obtained first and second content ratings data, and ii) cause the television signal receiver to prevent using of the program
20 signal if either one of the obtained first and second content ratings data correspond to a blocked content rating setting of the respective first and second content ratings systems.

7. The television signal receiver of claim 6, wherein said digital television signal processor is operable to separate the first and second content ratings data from an auxiliary data portion of the digital television signal.

5 8. The television signal receiver of claim 7, wherein said digital television signal processor comprises a first content rating system processor operable to process the first content rating data of the auxiliary data portion of the digital television signal, and a second content rating system processor operable to process the second content rating data of the auxiliary data portion of the digital television
10 signal.

9. The television signal receiver of claim 8, wherein the first content rating system processor comprises a United States V-chip content rating system processor and the second content rating system processor comprises a Canadian V-chip content
15 rating system processor.

10. The television signal receiver of claim 6, wherein the digital television signal processor is operable to obtain a program signal from the tuned digital television signal comprising one or more of a video signal and an audio signal.

20

11. A television signal receiver comprising:

means for receiving a digital television signal containing first and second content ratings data;

means, connected to said means for receiving, for processing the received
25 digital television signal to i) obtain a program signal from the tuned digital television

signal, and ii) separate the first and second content ratings data from the tuned digital television signal; and

content rating means, connected to said means for processing, for i) processing the obtained first and second content ratings data, and ii) causing the television signal receiver to prevent using of the program signal if either one of the
5 obtained first and second content ratings data correspond to a blocked content rating setting of the respective first and second content ratings systems.

12. The television signal receiver of claim 11, wherein said means for processing
10 the digital television signal is operable to separate the first and second content ratings data from an auxiliary data portion of the digital television signal.

13. The television signal receiver of claim 12, wherein said content rating means comprises a first content rating system processor operable to process the first
15 content rating data of the auxiliary data portion of the digital television signal, and a second content rating system processor operable to process the second content rating data of the auxiliary data portion of the digital television signal.

14. The television signal receiver of claim 13, wherein the first content rating
20 system processor comprises a United States V-chip content rating system processor and the second content rating system processor comprises a Canadian V-chip content rating system processor.

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15. The television signal receiver of claim 11, wherein said means for processing the digital television signal is operable to obtain a program signal from the tuned digital television signal comprising one or more of a video signal and an audio signal.

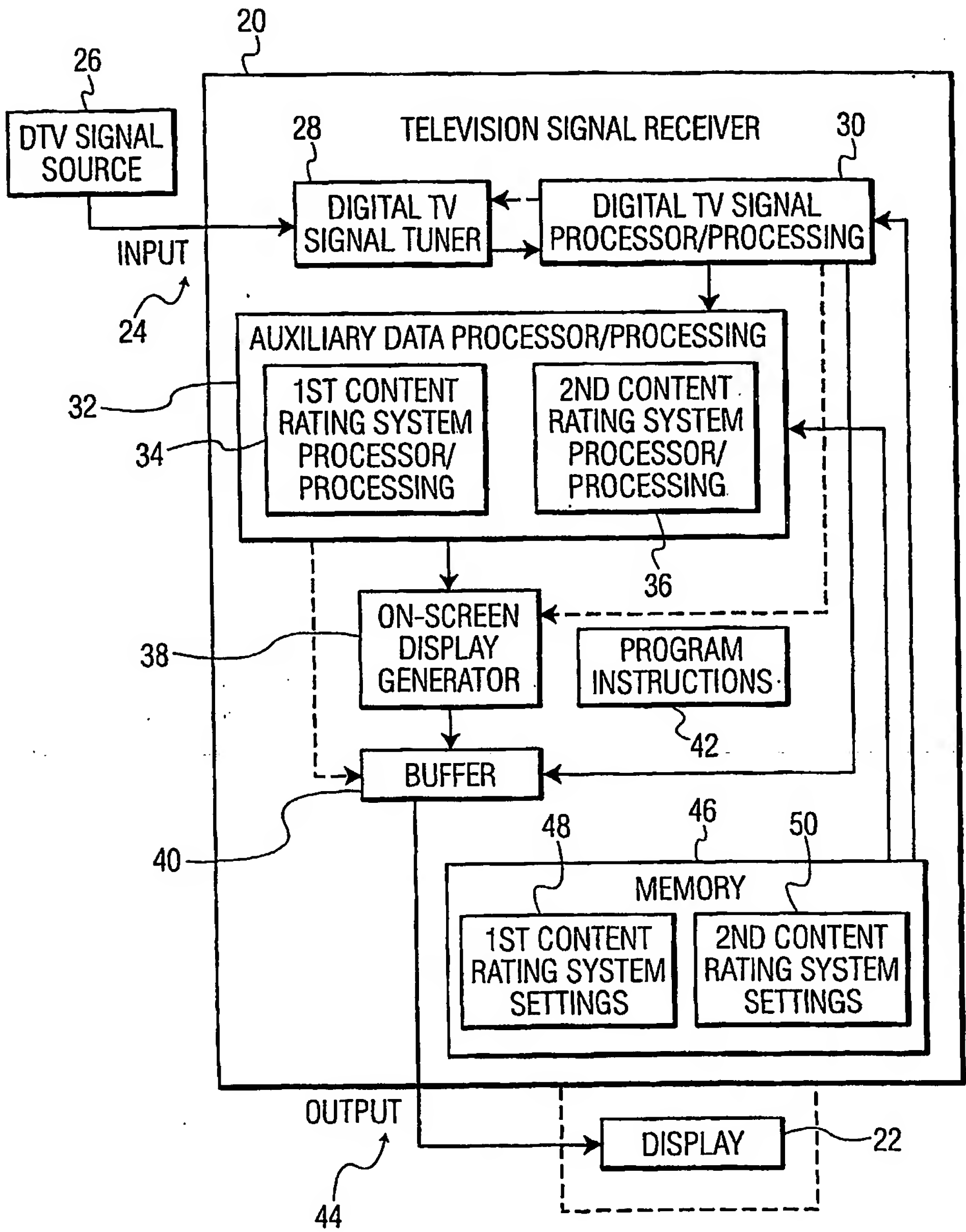


FIG. 1

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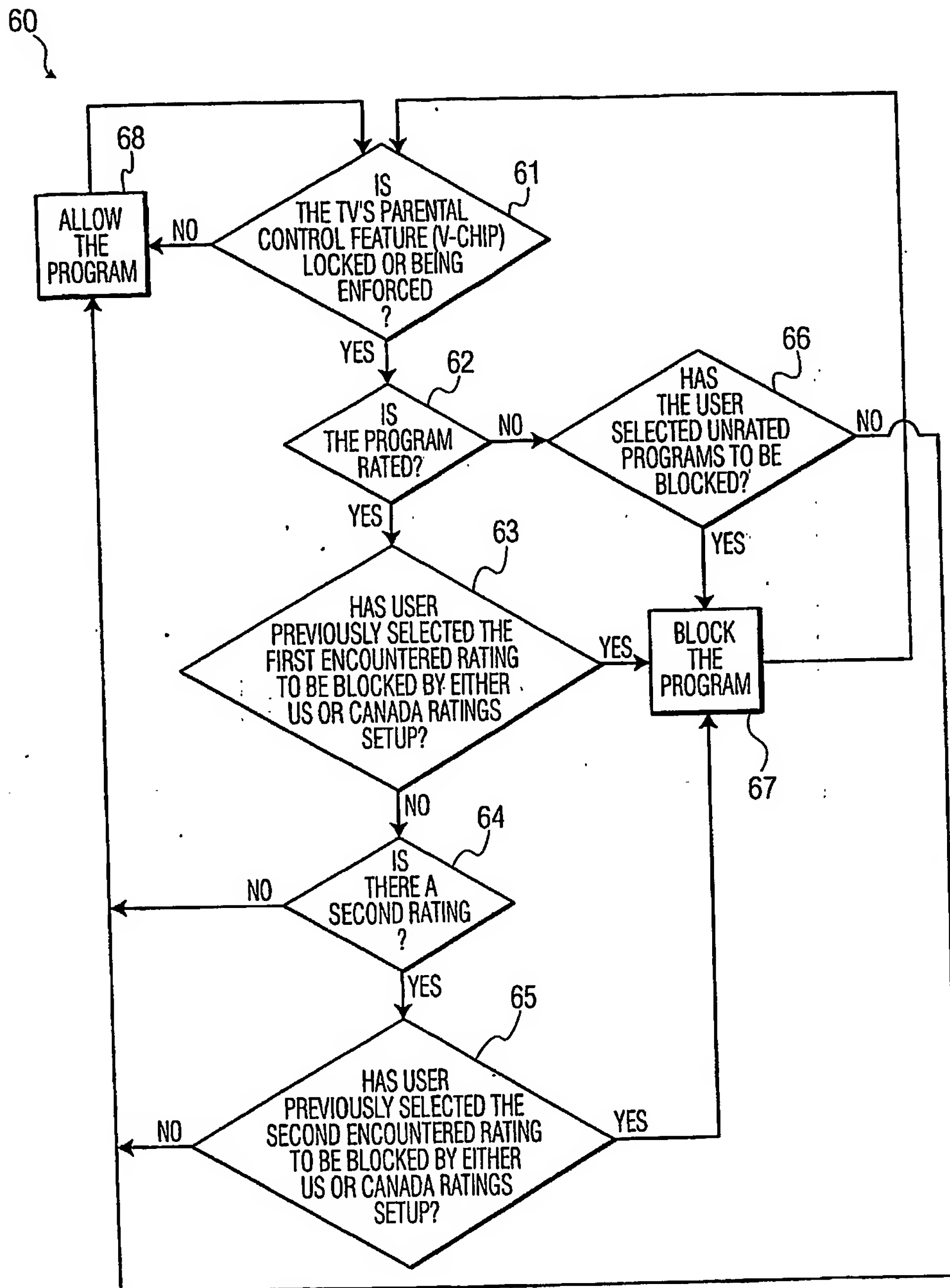


FIG. 2